

WHAT IS CLAIMED IS:

1. An orthogonal frequency division multiplex modem circuit which uses a plurality of subcarriers for communication, and transmits and receives a plurality of communication channels,  
5 wherein each of a plurality of sub carrier groups into which the plurality of subcarriers are divided is assigned to each of the plurality of communication channels.
2. The orthogonal frequency division multiplex modem circuit according to claim 1, wherein the assignment of sub carrier  
10 groups to the respective communication channels is adaptively performed.
3. The orthogonal frequency division multiplex modem circuit according to claim 1, wherein a modulation system given to each of the sub carrier groups is changed according to QoS (Quality  
15 of Service) needed for a corresponding communication channel.
4. The orthogonal frequency division multiplex modem circuit according to claim 1, wherein means for randomizing alignment of the respective subcarriers on a frequency axis is included in a transmitting side, and means for de-randomizing a signal  
20 where the alignment is randomized is included in a receiving side.
5. The orthogonal frequency division multiplex modem circuit according to claim 2, wherein all subcarriers are assigned to

asinglechannelasrequired,whilecommunicationofotherchannels  
is stopped.

6. The orthogonal frequency division multiplex modem circuit  
according to claim 3, wherein the changeable modulation system  
5 uses at least any one of BPSK (Binary Phase Shift Keying), QPSK  
(Quadrature Phase Shift Keying), and QAM (Quadrature Amplitude  
Modulation), and a symbol point on a phase plane is changed  
according to the QoS.

7. The orthogonal frequency division multiplex modem circuit  
10 according to claim 3, wherein peak values of modulation symbols  
are determined so that transmission power of the respective  
subcarriers becomes the same irrespective of the modulation  
systems.

8. The orthogonal frequency division multiplex modem circuit  
15 according to claim 4, wherein the processing for randomizing  
positions of the respective subcarriers is updated every symbol.

9. The orthogonal frequency division multiplex modem circuit  
according to claim 8, wherein means for determining the  
randomization pattern every symbol and transmitting the  
20 randomization pattern every symbol to the receiving side is  
included in the transmitting side, and means for synchronizing  
transmission and reception of the randomization pattern is  
included.

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10. The orthogonal frequency division multiplex modem circuit  
according to claim 9, wherein a predetermined communication  
channel and a sub carrier corresponding thereto are assigned  
as the means for synchronizing transmission and reception of  
5 the randomization pattern.

11. The orthogonal frequency division multiplex modem circuit  
according to claim 10, wherein the predetermined communication  
channel and the sub carrier corresponding thereto are excluded  
from the randomization process.

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